AMENDMENTS TO THE CLAIMS

Claims 9-10 (Cancelled).

16. (Currently amended) A data storage device comprising:
an array of magnetic memory cells, each memory cell including a data ferromagnetic layer and a reference ferromagnetic layer;
a plurality of first traces extending in a first direction, each first trace ~~in contact with~~corresponding to a group of data layers; and
a plurality of structures extending in a second direction, each structure forming closed flux paths with a group of reference layers.

17. (Original) The device of claim 16, wherein the ferromagnetic layers have magnetizations that can be switched between first and second directions during write operations, only the reference layers being switchable between first and second directions during read operations.

18. (Original) The device of claim 16, wherein the first direction is roughly orthogonal to the second direction.

19. (Original) The device of claim 16, further comprising a circuit for setting the magnetization orientation of the reference layer of a selected memory cell in a first direction, determining a resistance state of the selected memory cell, setting the magnetization orientation of the reference layer of the selected memory cell in a second direction, determining a resistance state of the selected memory cell, and examining the change in resistance states of the selected memory cell.

20. (Original) The device of claim 19, wherein the circuit examines the change by determining the direction of resistance state transition.

21. (Original) The device of claim 19, wherein the circuit determines the resistance state of a selected memory cell by applying a potential to a structure crossing the selected memory cell; and supplying an equal potential to a subset of structures and traces not crossing the selected memory cell.

22. (Original) The device of claim 16, wherein each structure includes a conductor clad with ferromagnetic material, portions of the ferromagnetic material in magnetic communication with a group of reference layers.

23. (Original) The device of claim 22, wherein all but a surface of each conductor is clad, wherein the unclad surface of each conductor is in direct contact with a group of reference layers.

24. (Original) The device of claim 22, wherein portions of the ferromagnetic material define a magnetic gap over each conductor, the portions in direct contact with a group of reference layers.

25. (Original) The device of claim 22, wherein a dielectric layer electrically insulates at least one structure from its corresponding group of reference layers, and wherein electrically conductive, magnetically non-conductive segments extends between reference layers.

26. (Original) A method of reading a selected memory cell in the device of claim 16, the method comprising:

applying spaced apart first and second pulses to the selected memory cell, the first and second pulses having opposite polarity; and

examining a transition of resistance states of the selected memory cell.

27. (New) The device of claim 16, wherein each structure includes a conductor having a first portion that is clad with a ferromagnetic material and a second portion that is not clad, each second portion opposing its corresponding group of reference layers.

28. (New) The device of claim 27, wherein each second portion makes direct physical contact with its corresponding group of reference layers.

29. (New) The device of claim 27, wherein the second portions and the reference layers form magnetic air gaps.